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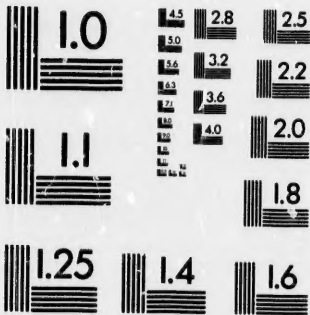
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REMARKS ON OVARIOTOMY

WITH AN APPENDIX,

CONTAINING THE

HISTORY OF SEVERAL TYPICAL CASES

MET WITH IN PRACTICE.

By J. W. ROSEBRUGH, M.D.,

(OF HAMILTON, ONTARIO)

*President of the Medical Faculty of the Hamilton City Hospital; late
President of the Hamilton Medical and Surgical Society, etc.*

READ BY TITLE AT THE

TENTH ANNUAL MEETING

OF THE

CANADA MEDICAL ASSOCIATION,

MONTREAL, SEPT., 1877.

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REMARKS ON OVARIOTOMY.

The operation entitled *Ovariectomy*, first suggested by William Hunter, first taught by John Bell, and first performed by Ephraim McDowell, has speedily come to be recognized as a legitimate and established procedure for the radical cure of ovarian disease; and, indeed, offers a more favorable prognosis than most other capital surgical operations. Never has any medical procedure risen more rapidly into favor, nor gained a stronger hold upon the professional mind, nor been more frequently resorted to by eminent practitioners throughout the civilized world, than has ovariectomy during the past quarter of a century.

Seeing that to the investigation of the etiology and pathology of ovarian disease have recently been brought the best thought and experience of the age, and that ovariectomy has in so short a period accomplished so grand a career, rescuing many valuable lives from a premature death, this operation is justly entitled to be regarded as the monarch of gynecology.

Considering the growing frequency of the operation in the Dominion, it is desirable that the profession should discuss the different methods now practiced, with the view to arrive, if possible, at some definite conclusions as to the best means of completing the several steps thereof. In this, as in every new development of science, the advance is not uncontested. There are to be found those who, with equal honesty and tenacity, hold opposing convictions. Ovariectomy has not won its final triumph, though destined so to do; its progress has been a succession of brilliant victories, and ere long we may hope to see it coming out of the strife, its last opposition overcome, and having accorded to it a place chief among capital operations—

“ Like some tall cliff, whose awful form
Swells from the vale, and midway leaves the storm.
Though round its base the threatening clouds be spread,
Eternal sunshine settles on its head.”

When about to perform this operation for the first time, being anxious to find some definite rules for guidance at certain points, great was the sense of disappointment upon finding that the acknowledged authorities did not supply the information required by a beginner. To remedy this defect, I was obliged to consult the record of cases published by different operators, in the several medical journals, and decide upon the plan to be adopted under certain circumstances. Recently, however, abundance of information on the several unsettled questions has been supplied, and though we have neither the literature, the tradition, nor the sobered reasons of centuries to guide us in this, as in the better known capital operations, fortunately some of the greatest modern lights have sufficiently explored this hitherto unknown realm, with such brilliant results as startle the world, while supplying data, that to the reflecting mind will furnish rules for guidance in further operations—rules that may, as in all practice, from time to time, be amended, as new discoveries are made.

Though ovariectomy is of only recent date, there have been attracted to its investigation numbers of men eminent in the profession—the peers of the men of the past—who have pursued their researches from widely different points of observation, and with so impressive results, that already from the mass of testimony thus supplied, we may glean such important facts as will enable us to reach conclusions, which we venture to predict, experience will but confirm. True, some of the most experienced authorities have expressed the opinion that we are only on the threshold of knowledge respecting the etiology, pathology, and treatment of ovarian disease, and in their modesty refrain from making any deductions. The wisdom of such a course is open to question. On the other hand, is it not their privilege, aye, and duty, to classify and utilize the knowledge already gained? Many things may be true which are comparatively valueless. To know the facts is important, but a further effort and patience in the pursuit of truth are required to ascertain their relative value. The line must be drawn somewhere. Probably were we to attempt, at present, to distinguish between the different methods practiced in ovariectomy, no two investigators would be found agreeing in every particular. This supposition justifies the expectation now indulged, that the subject chosen for discussion this morning will prove interesting and profitable to all present.

The discussion of ovarian disease—its diagnosis and various methods of treatment, is not designed in this paper; but the diagnosis having been made, and ovariectomy decided upon, it is proposed to ascertain which are the most successful, and consequently the most

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useful methods of accomplishing the various steps of the operation. The plan proposed is to give a *resume* of what the writer believes to be the best methods now practiced, and to assist in eliminating a mass of rubbish, which at present encumbers the literature of this procedure. A desire for brevity, and the intention to avoid, *en passant*, a discussion of those points which may be more advantageously considered at the close of the paper, must excuse the peremptory manner in which the writer's views are occasionally expressed.

PREPARATIONS FOR THE OPERATION.

The operation should be undertaken only by that surgeon who realizes the full weight of the responsibility he assumes, and determines to be thoroughly prepared for every step of the procedure, as well as any emergency that is liable to occur; for, unquestionably, success greatly depends upon the preparations previously made, the care and skill exercised during each stage of the operation, and particularly the vigilant supervision given to the minutiae of the after-treatment. When possible, choice should be made of a pleasant and healthy locality, and of a large and cheerful room, capable of being heated and ventilated. The room should be thoroughly cleansed, the ceiling whitened, the walls calcimined or newly papered, and the woodwork and floor well washed, using plenty of soap and water. The carpet and furniture should be new, and the bedding clean. It will be found convenient to have two beds, as nearly alike as possible, in the room, so that the patient may be easily lifted from the one to the other. The patient having, after a full and candid explanation to her of the possibilities of the operation, voluntarily decided to avail herself of this prospect of a radical cure, this question ought to be regarded as settled; and from that hour all discussion on that point entirely avoided, while every means should be employed to inspire her with hope and courage. In the absence of urgent symptoms, time should be taken to improve her physical condition, and elevate her vital powers. She should be kept free from excitement, her food nutritious and easily digestible, the bowels regular, and the kidneys secreting a proper quantity of normal urine. A few days preceding the operation, she should occupy her lying-in room, and be treated as an invalid. The evening before, or the morning of the operation, the bowels should be thoroughly evacuated by a sufficient dose of castor oil, after which, on account of the liability to sickness from the anæsthetic, no solid food should be allowed. A kind, intelligent and experienced nurse should be secured—one who will faithfully and tenderly attend the patient, and maintain a firm yet gentle discipline in the room. It is obviously impracticable to decide, with absolute

certainly, upon a fine day for the operation, as has been recommended, with the wind in a certain quarter. The choice has to be made some days previously, and no ordinary weather prophet can calculate with much certainty the state of the weather two or three days hence. The patient prepared, the nurse and assistants on hand, and everything being in readiness, it would be exceedingly inconvenient to postpone the operation on account of a rainy day or an east wind. The operator should have a written list of all the instruments and utensils usually needed, including those rarely required in any emergency; this list should be checked, and the instruments properly arranged on the table, convenient to his hand.

One hour previous to the operation, the patient should receive thirty drops of laudanum, and immediately before the anæsthetic, a little brandy and water. The anæsthetic administered, the assistants enter the room, the temperature of which should be maintained at about 80°, and all liability to drafts from the opening of doors and windows prevented. The patient is then lifted from the bed and placed upon a narrow table, made comfortable with folded blankets and sheets, in front of a large window, transmitting an abundance of light. Her feet and legs should be kept warm by means of woollen stockings, flannel drawers and a light blanket. The feet rest upon a stool or chair at the foot of the table. It is necessary to have five or six skillful, cool-headed assistants, free from all taint or suspicion of contamination, arising from dissections, *post mortems*, suppurations or contagious diseases. The nurse must have in readiness, in the room, plenty of hot and cold water, carbolized water (1 to 100), a tub, several pails, wash bowls, soap, towels, soft flannels and cotton cloths, napkins, etc. She should have three pairs of new sponges, readily distinguishable from each other: one pair for the external wound; the second, a large pair, for the contents of the tumor; and the third pair, extra soft and fine, for cleansing the peritoneum. Care must be taken to keep each pair in separate dishes, and the assistant who sponges the contents of the tumor must be careful not to touch the sponges reserved for the peritoneum.

The operator takes his place on the right of the patient, with his chief assistant directly opposite. The one in charge of the instruments should be familiar with his duties, and ready to anticipate the wants of the operator. The assistant in charge of the anæsthetic should be accustomed to its administration, and one who could be relied upon to faithfully discharge his duties, regardless of the progress of the operation. The anæsthetic should be given in such quantity only as is necessary to maintain quietude. This is important, owing to the tendency to prolonged sickness and vomiting after ovariectomy. When chloroform—

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which I prefer—is used, it is astonishing how little is required to keep up complete anæsthesia, especially when sprinkled guttatim upon one thickness of the napkin covering the nose and mouth, and held closely around the chin to prevent the loss of vapor, while the air is freely admitted from above on either side of the nose.*

All things being in readiness, the bladder should be evacuated with a catheter by an assistant, before commencing the operation.

THE ABDOMINAL INCISION.

The abdominal section is now always made in the median line between the umbilicus and symphysis pubis, the length required depending somewhat upon the nature of the contents of the tumor. Even for exploratory purposes the incision should be about five inches long which will usually be found sufficient to allow of the extraction of the tumor after its size has been reduced; but, if not, the incision can afterwards be lengthened. The section is made with a strong scalpel, commencing below the navel, at a point which will make a proper length of wound ending an inch above the pubic symphysis. Care must be taken to make the dissection along the median line, through the skin, areolar and adipose tissue, down to the *linea alba*. When this *tendinous line* has been reached, and uncovered throughout the extent of the external wound, it is picked up by a tenaculum, opened, a grooved director passed underneath, and carefully avoiding the sheath of the rectus muscle on either side, the aponeurosis is divided along the *linea alba*, from end to end. One more structure—the fascia transversalis with some adipose tissue—having been opened in a similar manner, the peritoneum is exposed. A little time should now be taken to sponge the wound and arrest the hemorrhage. The peritoneum is then raised by the tenaculum, snipped, and divided upon the director. A small quantity of straw-colored serum now usually escapes from the lower end of the wound, and occasionally, if not prevented by an assistant controlling the upper end, a loop of intestine will protrude. The peritoneal cavity having been thus opened, the tumor is brought into view, and in most cases presents the bluish-white glistening aspect of an ovarian tumor, but in some instances, especially compound cysts, the appearance is darker, redder, and more vascular. In other cases, a loop of intestine may first present itself; the great omentum readily recognizable by its characteristic adipose appearance, may, like an apron, extend over the tumor; or a very vascular membrane may cover it, which on investigation proves to be hypertrophied projections of the pedicle, containing large blood vessels. Some of these unexpected

* Perhaps the most systematic method of administering chloroform is that adapted by Dr. A. M. Rosebrugh, of Toronto, in his Ophthalmic practice. See CANADA LANCET, vol. 5, p. 622.

complications are very embarrassing to some operators in the excitement of the hour, but a cool, quiet investigation will soon serve to clear up the perplexity, and the experienced surgeon will prove himself equal to the emergency.

ADHESIONS.

The tumor having been exposed to view, search is made for adhesions. The hand is washed, plunged into warm carbolized water, and two or three fingers are passed around between the tumor and the abdominal parietes. If slight adhesions are met with, they are gently broken down with the fingers. I have found the large curved steel sound, recommended by Professor Thomas, an excellent instrument for a more extended search for adhesions. It is warmed, dipped in the disinfectant, and passed gently around the tumor as far as the pedicle. With the aid of this harmless instrument the operator can satisfactorily assure himself of the presence or absence of adhesions around every part of the tumor excepting posteriorly. The most serious adhesions met with are strong attachments to the bladder, uterus, omentum and intestines. These bands must not be cut, unless first secured by a silk ligature; and this I believe to be a good and safe method. But it is usual to enucleate them from the tumor by the fingers or the handle of the knife. Another excellent method of separating strong adhesions, is by making use of the temporary clamp and actual cautery. When, however, the cyst is firmly adherent to the bladder, intestine, or uterus, a small portion of the cyst wall should be cut out and left adherent to the viscus, the secreting membrane being dissected away. In such cases great care must be exercised to avoid perforating the intestine or rupturing the fragile wall of the cyst.

TAPPING THE CYST.

The operator having confirmed his diagnosis, and ascertained that the removal of the tumor is possible, proceeds to diminish its size by removing the fluid contents. The cyst is seized at the upper end of the abdominal incision by strong toothed, or deeply grooved forceps, and steadied, while the large trocar is plunged into it. An excellent instrument for this purpose is the trocar known as Spencer Well's. It is an ingenious contrivance, self-retaining, and has a flexible tube attached, through which the fluid is conveyed into the receptacle below the table. When one of these trocars cannot be obtained in a country town, a large tube, sloped and pointed at one end, may be improvised for the occasion, an opening being made for it by a scalpel. In such an event, and indeed in all cases where there is danger of the contents escaping into the peritoneal cavity, it is best to turn the patient on her

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left side, while the fluid is flowing away, and every precaution must be taken with sponges and flannels to prevent the contents getting into the peritoneum. In the mean time, the assistant is keeping the cyst well into the wound, by steady traction with the forceps, while another compresses the abdominal walls against the tumor by one hand on each side of the incision. In compound tumors, after the parent cyst has been evacuated, others come into view, and are, one after another, tapped and emptied. The contents of some cysts are very gelatinous and tenacious, passing out through even a large tube very tardily. Under such circumstances, the patient being on her side, I have expedited their evacuation by laying them open freely with a scalpel. In other cases, the contents are semi-solid, or composed mostly of small cysts—honey-combed, which have to be incised, broken down with the hand inside, and scooped away before the cyst can be sufficiently reduced to be extracted through a fair sized opening.

REMOVAL OF THE TUMOR.

As the cyst is being emptied of its contents, the assistant, by continued traction with the forceps, gradually withdraws the lessened tumor through the incision, assisted, in most cases, by the hands of the operator. Care is now taken to have the tumor well supported by the assistants, to prevent its falling, or dragging injuriously on the pedicle. When the length of the pedicle will permit, it is good practice to tie it tightly with whip-cord, near the tumor, make a loop with the cord with which to manipulate the pedicle, and cut away the tumor. This may now be entrusted to a skillful and experienced assistant, who will attend to any unruptured adhesions according to the methods previously described, while the operator gives his attention to the pedicle.

SECURING THE PEDICLE.

We come now to the most important step of the operation—the treatment of the pedicle. The most effectual methods of securing the pedicle is certainly the most important, and the most anxious question the operator has to consider. He is impressed with the recollection that in his management of this step of the operation, he is required not only to effectually and permanently secure the stump against hemorrhage, but this must be done so delicately as not to drag or twist the uterus, nor inflict the slightest injury upon the parts which are to remain within the peritoneal cavity, so that there shall be no tissue likely to decompose or give rise to septic absorption; for it is obvious the success of the operation in no small measure depends upon how these objects are accomplished—what risk is run of hemorrhage, shock,

peritonitis, and septicæmia—the four great sources of mortality after ovariectomy. It is, therefore, not surprising, nor to be deprecated, that this question has been anxiously discussed among ovariectomists, and various methods of procedure warmly advocated.

The various methods practiced and recommended by their advocates, may be classified thus :

1. *The Extra Peritoneal.*
2. *The Intra Peritoneal.*

Extra-peritoneal ("without" the peritoneum).—Under this division may be included the various modes of securing the pedicle outside of the peritoneum. This object is generally accomplished by either bringing the pedicle through the lower part of the incision, and fixing it outside with a clamp before dividing it, or first ligaturing the pedicle with silk, catgut, wire, or some other agent, and then either fixing it outside, or with the abdominal parietes while closing the wound. The various plans resorted to for this purpose, have the same object in view—to keep the stump of the pedicle securely in or outside of the abdominal wound so that it cannot drop into the peritoneal cavity, and there become the source of mischief. For the sake of brevity, I shall include all methods having the above objects in view, under the designation of the *clamp method*, as I believe the fixation of the pedicle externally can best be accomplished by a good, strong clamp—such as used by Mr. Spencer Wells. It should be borne in mind that some pedicles are very large and vascular, two or three inches in breadth, and containing the following structures: the broad ligament, the Fallopian tube, the ovarian ligament, sometimes the round ligament, several very large arteries, and a number of greatly developed veins; and all this mass must be firmly and effectually secured, if possible, against the perils already mentioned.

The clamp method consists in embracing the whole pedicle, outside the abdominal wound, with a strong metallic constricting instrument, capable of being screwed together very tightly, and cutting away the tumor about half an inch outside of the clamp. The abdominal wound is then neatly closed around the pedicle, under the clamp, and the stump thus firmly held is so treated as to prevent any septic matter from finding its way into the peritoneal cavity.

This, it is claimed, possesses advantages over the intra-peritoneal method, where the stump of that large vascular mass, whether severed by the actual cautery, "tied and dropped," or treated by any other plan, remains within the peritoneal cavity, where it is liable to become the source of septic decomposition, and hazard the patient's life.

The clamp method has been, and still is, the one most generally

practiced; it was introduced by Mr. Jonathan Hutchinson, and is nearly always employed by Mr. Spencer Wells—that prince of ovari-otomists, who himself has performed the operation nearly one thousand times, thus adding, according to the calculation of Lord Selborne, 20,000 years to the lives of European women.

Intra-peritoneal ("within" the peritoneum).—Under this shall be included all modes which leave the stump of the pedicle within the peritoneal cavity: the actual cautery, the galvano-cautery, the *ecraseur*, acupressure, deligation by various ligatures, torsion and enucleation.

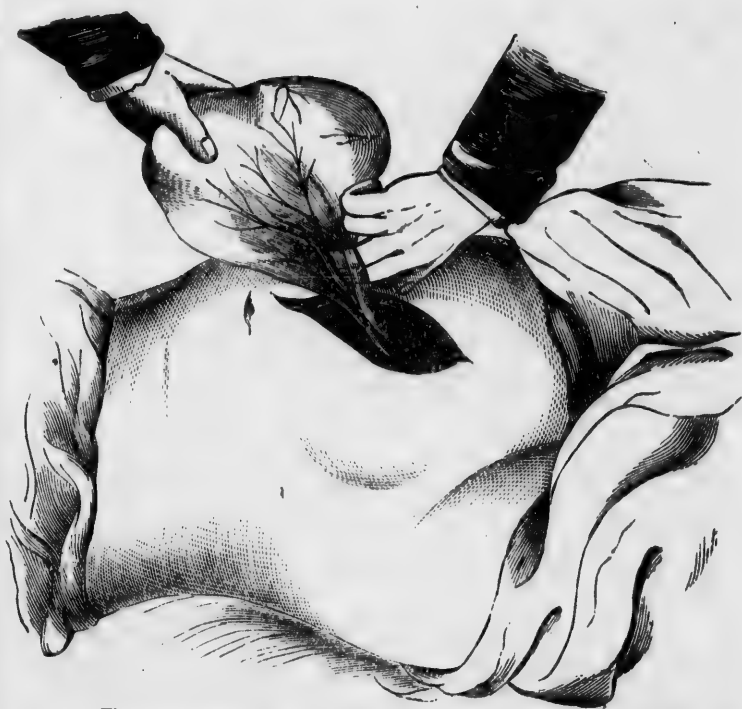
Several members of this Association, in attendance at the International Medical Congress, in Philadelphia, had the pleasure of hearing Dr. Miner, of Buffalo, describe in plain, lucid language, his plan of performing "ovariotomy by enucleation," and were deeply impressed with the conviction that his procedure is a capital method, in some cases at least, especially where the pedicle is so broad and short that it is impossible to apply a clamp, and hazardous to attempt to secure it by a ligature, or divide it by the actual cautery. In a recent operation, where the pedicle was of this description, I availed myself of the method of enucleation, to separate the pedicle several inches from the tumor, in order to get sufficient length to allow of securing it by a double ligature. This process enabled me to complete the operation satisfactorily, and the result was successful.* I therefore feel indebted to Dr. Miner for giving his valuable discovery to the profession.

Dr. Miner's remarks were reported in the Transactions of the International Medical Congress, and may be abbreviated as follows:

"It is well known that the ovarian tumor is surrounded by a peritoneal covering; that the pedicle, proper, usually divides into three or four parts, passing up over the walls of the tumor in bands of variable width, which contain vessels, often of large size, and which gradually diminish in thickness and in the size of the contained vessels, until finally they are lost in simple, thickened portions of peritoneal covering. The peritoneal investment is not closely attached to the cyst, but separates readily, just as the peritoneum separates elsewhere in the pelvic cavity, being immediately lined by the subserous cellular tissue; thus no vessels of any considerable size enter the cyst. The tumor separates from its attachments with remarkable readiness, so much so that, in several instances, it is reported to have escaped the grasp of the operator, and fallen spontaneously from the pedicle by accident, thus plainly indicating the natural and proper method of removal.

My surgical friends who have seen the operation, unite in regarding it as the most natural surgical procedure possible. To see it, is to be convinced of its entire feasibility and safety, while its advantages are too apparent to require a moment's consideration.

* See Appendix, Case III.



The accompanying cut,* from a drawing by Dr. Edward N. Brush, who has several times assisted me in operating, will give a very fair idea of the procedure. The fingers of the operator are represented beneath a vascular portion of the pedicle, separating it from the walls of the tumor.

This separation is to be carefully made, until the vessels are traced to their termination. To make the illustration plainer, the tumor is represented as raised from the abdominal cavity, and supported by the hand of an assistant; but, of course, where extensive adhesions are present, this is impossible, and the risks of removal are greatly augmented.

Formerly, the operation in such cases was abandoned. When adhesions exist, they are to be separated, and the process continued to the pedicle. The capillary vessels thus broken (during the process of enucleation) do not bleed, for the band contracts, and corrugates the larger trunks, while the broken off capillaries ooze a little for only a minute or two, and a dry napkin, applied for a short time, is all that is required."

As for securing the pedicle by the less valuable methods—acupressure, *écraseur*, the galvano-cautery, or by twisting and torsion, I shall not take up your time in discussing, as they possess no advantages;

* Kindly loaned by Dr. Miner.

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but the remaining two methods—the actual cautery and the ligature—demand especial consideration.

The Actual Cautery.—This method, introduced by Mr. John Clay, a celebrated ovariologist, of Birmingham, England, for the purpose of arresting hemorrhage from parietal and visceral adhesions, was seized by Mr. Baker Brown, for the treatment of the pedicle also; and with most excellent results. It consists in compressing the pedicle with a temporary clamp, while being divided, or rather sawed off, by a wedge-shaped cautery iron, heated only to a white heat, so as to burn its way slowly through the structure. The clamp is then unscrewed, and after waiting a short time, to secure if necessary any bleeding vessel by a ligature or another touch of the cautery, the stump is allowed to recede into the peritoneal cavity, and the abdominal wound is completely closed. Although this plan of dividing the pedicle yielded unparalleled results in the hands of the late Mr. Baker Brown, very few since his lamented death have adopted his procedure, except in cases with very short pedicles, and then only as a *dernier ressort*. Recently, however, one of the most brilliant ovariologists of the day—Mr. Thomas Keith, of Edinburgh—has practiced this method in over fifty cases, “and, out of 241 operations (by various methods), has saved 206 lives—a success hitherto unequalled in the history of any capital operation.* But most operators seem anxious to avoid this mode, except in cases where neither the clamp nor ligature is applicable; appearing to think that the danger of secondary hemorrhage, decomposition, and septic absorption is increased thereby. For instance, take the following quotations:

“In ovariectomy, the great thing is security against hemorrhage; and that, I think, is best gained by the use of the clamp or the ligature.” Dr. Robert Barnes. *Transactions of the International Medical Congress, of Philadelphia*. Page 806.

Prof. Thomas, in his excellent work on the Diseases of Women, says:

“Mr. Baker Brown introduced the plan of amputating the tumor by means of the actual cautery, and claimed the astonishing results of twenty-nine cures in thirty-two operations. The insecurity against hemorrhage attendant upon the method will probably prevent its competing with those already mentioned, but in certain rare cases in which the part to be amputated is deep within the pelvis, it offers great advantages.”

Schreder, in his recent work, page, 422, remarks as follows:

“The actual cautery is especially recommended by Baker Brown. The fear that the gangrenous eschars, replaced within the abdominal cavity may excite peritonitis, seems to have little foundation. The reproach is better grounded

* The great strength of Dr. Keith lies in the thorough preparation of his cases, and in the care which he takes with them; personally I am ready to use any method that the case may demand.” Dr. Alexander R. Simpson, of Edinburgh. *Transactions of the International Medical Congress, Philadelphia*. Page 807.



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that cauterization does not surely prevent subsequent hemorrhage, especially from the large vessels; and the combination of ligature with cauterization of the pedicle seems to involve serious danger, because gangrene of the ligated portion more readily occurs under these circumstances."

And very recently, in a clinical lecture on the treatment of the pedicle in ovariectomy, Mr. Christopher Heath made the following statement:

"I have employed it (the actual cautery) in several of my cases with good effect, but I do not think it so safe as the ligature; for however careful you may be to cut the pedicle slowly with an iron, not too hot, so as to sear the cut edges thoroughly, there is always the risk of some small vessels bleeding and requiring a ligature, and sometimes the burnt edges become separated and the bleeding is free. It is exactly the difference between applying torsion to a large artery and putting on a ligature; with the last one feels perfectly safe, whilst with the former something *may* go wrong."

On the other hand, Mr. Thomas Keith, after his large experience, gives it as his opinion that:

"It is a good method, and one which has had scant justice done it since Mr. Baker Brown's death."

Apart, however, from Dr. Keith's large experience, nearly all ovariectomists agree that the cautery method possesses great advantages in certain cases, especially when the pedicle is very short and deep within the pelvis. The only conclusion, it appears to me, deducible from this reasoning, is, that if the cautery method offers great advantages in certain difficult cases, it would answer even better in all favourable ones.

The Ligature.—The most approved manner of securing the pedicle by this procedure consists in passing a strong double ligature, made of silk, through the centre of the pedicle near its root, with a probe or large needle, dividing the loop and tying each half separately, and as an extra precaution passing one of the ligatures tightly around the whole pedicle; the ligatures are all cut off short, the pedicle divided half an inch outside of the ligatures, the stump dropped into the pelvis, and the abdominal wound absolutely closed. This method of "tying and dropping," according to Dr. Peaslee, one of the best authorities on these questions, was practiced in New York over fifty years ago. But to the late Dr. Tyler Smith belongs the honor, at all events, of reviving and popularising the method, he having had a series of most successful cases.* Tyler Smith used Indian hemp; Marion Sims, silver wire; and others various other agents, such as horse-hair, catgut, whip-cord, etc. It was claimed that catgut, being an animal substance and absorbable, would prove to be more effectual than any other agent; but experience proved that it was liable to slip and become

* I am myself inclined to the use of the ligature, and I now again refer to Dr. Tyler Smith's method of treating the pedicle as the best of all methods, and the one to which all others will, in my opinion, ere long give place.—Dr. E. R. Peaslee.

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untied, and consequently it failed to meet the expectation of its advocates. Gradually the good, old fashioned silk ligature—itsself an animal product—has become the favorite for this purpose; strange to say, however, whatever ligatures are used, it is impossible to find them a few months afterwards, and the question is, what becomes of them? It has been suggested that they become partially if not entirely absorbed; but the experiments of Spiegelberg, Waldeyer, and Maslowsky, on the horns of the uteri of animals, prove that not only the ligatures, but also the stump beyond them, become encapsuled by effused lymph. It is claimed for this intra-peritoneal method, that it is simple, easy of adaptation, applicable to all pedicles, and admits of the immediate closure of the abdominal wound in its whole length. That the "tying and dropping" method is a good and successful one, and gradually coming into favor, it is needless to dispute; indeed, it is easy to foresee that it is destined, ere long, to become the favorite procedure.

Having given as much space to the consideration of the best methods of securing the pedicle, as a paper of this kind will permit, it is now only necessary to make a few remarks by way of endeavoring to "draw the lines" a little closer than has heretofore been attempted. We have seen that there are two methods worthy of commendation: *The extra-peritoneal*, and the *intra peritoneal*. We have seen that the extra-peritoneal method is best accomplished by means of a clamp, secured external to the abdominal wound, and the intra-peritoneal method, by either enucleation, the actual cautery, or the silk ligature; neither method appearing to possess advantages superior to the other.

The conclusion that forces itself upon the writer is, that either method, well-performed by a painstaking and skillful operator, who gives personal and great attention to the details of the preparation and after treatment of his patients, will yield about equal results; and, consequently, it does not matter much to which method recourse is had, provided it is well executed and receives the same vigilant supervision.

It is highly important, therefore, that the operator should be unprejudiced—not wedded to any particular plan; but that he should proceed to each case prepared and desirous to adopt that method which, under the circumstances, seems best adapted to that particular case.

CLEANSING THE PERITONEAL CAVITY.

Before closing the external incision the opposite ovary must be examined, and if cystic degeneration have commenced there, the ovary should be removed and the peritoneal cavity thoroughly cleansed; carelessness at this stage may jeopardize the result of the operation, as every particle of *debris* remaining is liable to decompose. After the

hemorrhage* has ceased and all coagula been removed, the abdominal parietes, the intestines, and particularly the pelvic cavity must be carefully and thoroughly sponged, with new, soft sponges frequently squeezed out of warm, slightly carbolized water.

DRAINAGE.

The propriety of inserting a drainage-tube into the pelvic cavity before closing the incision, in all cases where decomposition and septicæmia are apprehended, is a question still *sub judice*. By reference to the appendix it will be found that in several instances there recorded, the drainage-tube was thus inserted. In each of these cases, during the first and second days, a large quantity of reddish serum escaped around the tube and pedicle, saturating the dressings and folded sheets underneath the patient; threatening symptoms also appeared, but so soon as a small quantity of pus and debris were withdrawn through the tube, the pulse and temperature immediately fell, and convalescence was progressive thereafter.

I was induced¹ to make use of the drainage-tube from observing its beneficial operation in New York, while on a visit to that city in 1873. By kind invitation of Prof. Thomas, I enjoyed the privilege of seeing that gentleman perform ovariectomy, and insert the glass drainage-tube; and subsequently by invitation of Dr. Marion Sims, I had the pleasure of visiting the wards of the Woman's Hospital, and assisting him in washing out the pelvic cavity of one of his ovariectomy patients. In this case there was not only a tube through the abdominal wound, reaching down into Douglas's cul-de-sac, but also another tube passing up through the fornix vaginae into the same pouch. Through the upper tube a disinfectant fluid was gently and slowly injected, which came away through the lower one, bringing a quantity of pus with it. The injection was thus continued until the fluid returned clear. The patient had the hectic-flush, and, to me, appeared very low indeed. Regarding, at that time, such a condition hopeless, I remarked to Dr. Sims, as we left the ward, "That poor woman is near her end." He placidly replied, "She! no indeed, that woman is now convalescing nicely."

The importance of this step in the after-treatment of ovariectomy justifies, even at the risk of being considered tedious, the following summary of Prof. Thomas's published views thereon:

* "I have had two cases; one complicated with pregnancy, was attended with considerable hemorrhage. This I checked by the application of flannels dipped in hot water. In such cases I recommend hot water." Dr. Theophilus Parvin. See *Transactions of International Medical Congress, Philadelphia*, page 807.

¹ "I have also seen the per-chloride of iron used to sponge bleeding points after the sundering of strong adhesions, and without any of those formidable results which some writers attribute to its passage through the Fallopian tubes after inter-uterine injections." Dr. Robert Barnes. *Ibid*.

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"No one familiar with ovariectomy," he remarks, "will to-day doubt the assertion that the two factors which prove most fatal after it—septicæmia and peritonitis—are both in great degree due to the retention of putrescent materials within the peritoneal cavity. These materials have escaped from the cyst during or before the operation, or may consist of blood or serum oozing from vessels while the operation proceeds, or some hours after it has ended, or may arise from the emptying of pus into the peritoneum from inflammatory action. The importance of not only preventing the entrance of such elements into the peritoneum, and of removing them before closing the abdominal opening; but also of giving them free vent during the period of convalescence, has attracted the attention of ovariectomists. It is my uniform habit to insert a glass drainage-tube eight inches long, and varying in diameter from half to three-quarters of an inch, just above the pedicle and into the depths of Douglas's pouch, in every case except where there is absolutely no fluid left in the peritoneum. Should no fluid be left in the abdominal cavity, this tube should not be inserted, or if the operator be in doubt, it should be placed in position and kept tightly corked. If fluid accumulation exist, or its occurrence be rendered probable by slight oozing from broken adhesions, the tube should be left uncorked, that serum and blood may drain away. If no increase of temperature mark the occurrence of septic absorption, nothing more is necessary than to keep this in place until all danger has passed away. Should septicæmia show itself, a gum-elastic catheter cut off near its end should be inserted as far as possible, the glass tube drawn up for an inch, and a stream of warm water containing one drachm of chloride of sodium and sixteen grains of the crystals of carbolic acid to the pint, gently injected by means of a Davidson's or fountain syringe. No force whatever should be employed, but a free supply of water should be thrown in, until the return current comes forth clear. When the temperature or pulse rises, and the other symptoms of septicæmia develop, such an injection should be practiced once in eight hours. But without the tube is left from the time of the operation, it is difficult and sometimes impossible to reach the most dependent part of the peritoneum. In no instance have I seen evil result from this course, and hence I urge its employment.

"Septicæmia, which I believe will in time be admitted to be the most frequent cause of death after ovariectomy, is, when fully established, a most dangerous state. It is ushered in by dizziness; excessive muscular prostration; anorexia; great pallor; high temperature; small, rapid and very weak pulse; sometimes a low delirium; a dry tongue; and a sweetish odor of the breath. It is probably this condition which is so often alluded to as a 'typhoid state' after operations, and one cannot but suspect that many, if not most, of these cases quoted in Dr. Clay's tables as shock or collapse, occurring as late as the fifth, sixth, seventh, and tenth days, were really instances of this affection. The development of peritonitis and septicæmia should be carefully looked for. All the vital and physical signs which mark them should be constantly investigated, and their inception met by appropriate therapeutic means. Septicæmia, being the result, first, of the decomposition, and second, of the absorption of fluids in the peritoneum, is not likely to occur for several days, but it may take place in two or three weeks after the operation. If at any time the temperature should gradually or suddenly advance to 103°, 104°, or 105°, except just as the patient rallies from the immediate effects of anæsthesia and operation, fears should be entertained that peritonitis or septicæmia is developing. If it occur within four

days after the operation, it is likely to be the former. If after that time, the probabilities are greatly in favor of the latter. The pulse will usually become rapid at the same time, whichever morbid condition is developing, and it must not be forgotten that the two are often combined. Let no one suppose that septicæmia once established becomes irremediable. Experience disproves this; it is the prolongation of exposure to absorption of septic elements that constitutes the great danger of the condition. This method of meeting in an efficient and satisfactory manner the most fruitful source of danger after ovariectomy, I regard as second in importance to no other improvement which has been introduced since the discovery of the operation itself. It emanated from Dr. E. R. Peaslee, and has even now, I think, not assumed its legitimate position in the scale of importance."

This practice has not been very warmly accepted in Great Britain. English surgeons, proverbial for their slowness to adopt any new recommendation, have practiced drainage only in cases regarded as desperate, or likely to prove such. On the continent, however, it has been received with considerable enthusiasm, especially by the thoughtful German. But it is due to Prof. Carl Schröder, to say, that he doubts the utility of resorting to the use of the drainage tube in many cases where it is now used. In a recent article upon this subject he remarks:

"Let me once more state my views precisely, that the exudation after ovariectomy is not in itself the cause of the septicæmia, but it is on the contrary perfectly harmless unless it decompose; but that decomposition only occurs after infection, and that consequently the important point is not the removal of the exudation, but the avoidance of the infection. I should therefore decide upon drainage during the operation, only in case I believed—a state of things which should of course not happen—that the patient had become infected, or, in case decomposing masses from some suppurating cyst, e. g., had found their way into the abdominal cavity. Drainage of the abdominal cavity assumes a very different position as a therapeutic measure, against a septic peritonitis which already exists. For, although the exudation be neither the original cause nor the only symptom of the septic condition, it must still be conceded that its removal is highly desirable. It is true, this is then difficult to accomplish."

CLOSING THE ABDOMINAL WOUND.

This is generally effected with both deep and superficial sutures. Almost every variety of suture material has been employed for this purpose. The result of the operation, however, does not appear to depend upon the kind chosen. Most operators prefer silver wire, but Spencer Wells, and some others, nearly always employ Chinese silk. As the deep sutures are placed about an inch apart, the number to be used will depend, of course, upon the length of the incision; when the drainage-tube is inserted, and the pedicle is brought outside, they should be placed between the last stitch and the last but one. The threads should be about eighteen inches in length, with a long, straight needle affixed to either end. Each needle is passed from within out-

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wards, including a narrow margin of the peritoneal membrane, through the entire thickness of the abdominal walls, emerging at a point about three-quarters of an inch from the edge. All the deep sutures should be thus inserted before they are tied. The wound is now examined, and if any fresh oozing of blood have taken place, this must be sponged away. An assistant now, with one hand on either side of the wound, bulges up, as it were, the redundant walls, while the stitches are being tied or twisted. Then, in order to secure a nicer coaptation of the edges of the wound, superficial sutures are placed between the deep ones, which include only the skin and areolar tissue. All experienced operators agree in the advisability of including the peritoneum within the stitch, as it is found when the two edges are thus brought together they unite quickly by first intention; and this is desiderated in order that if suppuration take place outside, pus and other septic fluid may be prevented entering the peritoneal cavity.

The wound should then be covered with dry lint, or lint soaked in carbolized oil; over this and the whole abdomen should be placed a thick pad of dry cotton-wool, and several folded napkins, while broad strips of adhesive plaster should be passed nearly around the body, to support the abdomen in case of vomiting. Lastly a wide flannel bandage should secure the whole. The patient should now be placed in a comfortable bed, between blankets, and warmth for a time, even in hot weather, should be applied to her feet. The room is then darkened, and the patient left quietly alone with her nurse.

THE AFTER-TREATMENT.

As this is a matter of the greatest importance, the operator must, himself, give particular attention to the minutest details of the after-treatment. He should secure the assistance of a medical friend to supervise the case in his temporary absence, and a competent nurse must be in constant attendance night and day. The patient must be kept quiet, at rest, and free from pain. To accomplish this, an opiate should be administered hypodermically, or per rectum. To prevent vomiting, a little ice may be allowed, but no food or drink. If the powers of life seem to be flagging, a little brandy and iced water must be given by the mouth, or an enema of milk and brandy. The room must be kept comfortably warm, at an even temperature, but well ventilated. This can be easily effected by a little fire in the grate—the best of all ventilators for a sick-room, or a gas jet can be kept burning in the fireplace. The bladder must be emptied by a catheter every six or eight hours; the bowels should be kept constipated seven or eight days, but in case

the intestines become distended with gas, they may be unloaded by a simple enema of warm water, as early as the fifth day.

Should vomiting persist after the effects of the anæsthetic have passed away, neither food nor drink should be allowed by the mouth—absolutely nothing, excepting ice to suck, and perhaps a dessert-spoonful of lime-water and milk, in equal parts, at stated intervals. Life must be sustained by rectal alimentation.* Enemata of nutritive materials already prepared for assimilation, as beef-essence, beef-tea, mutton, oyster or chicken broth, or egg beaten in milk, may be administered every three or four hours, in quantities of about four ounces at a time. Brandy and medicines, when necessary, may be added to the injections. The nutritive material should be strained and warmed previous to being administered, after which the anus must be supported for a time by firm pressure with a napkin. After three or four days, when all tendency to vomiting has ceased, or as soon as the stomach begins to crave food, small quantities of light nourishment may be tried. A spoonful of milk, beef tea, or oyster broth, may be given at frequent intervals, and if such nutriment agree with the stomach, other articles of similar diet and small portions of solid food can be permitted.

If the patient appear to be doing well, as indicated by the general symptoms—pulse, temperature, respiration, and freedom from pain—the wound need not be examined till the third or fourth day, when it should be cleansed and dressed with fresh materials. Should suppuration be then commencing in any part of the wound, or around the pedicle, this must be carefully sponged twice or thrice a day, after which, the wound is each time dressed with lint soaked in carbolized oil. The upper part of the incision usually unites immediately by first intention, and the whole wound in four or five days; but the sutures are not removed until the seventh or eighth, unless some of them become a source of irritation. When the clamp has been employed, it is left undisturbed until it becomes loose and ready to be removed without any traction; the time varies with the thickness of the pedicle, but it usually falls off about the eighth or tenth day.

After the sutures and clamp have been removed, the abdomen must be supported by adhesive plaster, pads of cotton wool and an abdominal bandage. Even when the patient leaves for home, she should be enjoined to continue the support by an elastic bandage, corsets, or some other abdominal supporter.

* That life can be sustained with nutritive injections, by the rectum, is proven in cases 4 and 5 of the Appendix. It is only within the past few years that the importance of this means of sustaining nutrition has been recognized by the profession. Of late, recourse is more frequently had to this method of nourishing the patient, not only in persistent vomiting after ovariotomy, but also in the various diseases in which food cannot be swallowed nor digested by the stomach; and recently cases have been reported in which life had been sustained, by this means, during periods varying from three months, to three, and even five, years. The question remains to be determined: whether the nutritive material thus administered is digested or merely absorbed.

SHOCK.

Occasionally, however, ovariectomy cases do not get on so favorably as above indicated. It not unfrequently happens that the nervous prostration we are accustomed to speak of as exhaustion, shock, or collapse continues after the usual time expected from the effects of anaesthesia and the operation. The patient does not rally, but gradually sinks, in spite of our best endeavors to revive her failing powers. With this depression of the vital forces most of us are familiar, as occurring after capital operations, and railway and other severe accidents. In reference to this condition, Dr. Barnes makes the following original and pertinent observations :

"A considerable proportion of all the deaths, I am convinced, occurs from *shock*. Recovery from this is greatly a question of individual power of endurance. We can hardly foretell what this power is in any particular case. Women recover from the severest operations attended by all the complications considered the most formidable ; others sink after the easiest and simplest operations. Women comparatively robust succumb, whilst the apparently fragile recover. In many cases the unexpected result is not due, at least appreciably, to difference in skill.

"It can only be referred to innate power of resistance. This is an unknown quantity, and is the chief cause of the uncertainty which surrounds the operation. No doubt the shock can be lessened by care and skill during the operation, and the patient can be to some extent supported through it."

Vigilant supervision and good management by the operator, personally, at this critical time, may succeed in reviving the sinking powers. Warmth, even in hot weather, must be kept constantly to the feet, legs, axillæ, and cardiac region. When the stomach will retain stimulants, iced brandy or iced champagne can be given by the mouth. But, when obstinate vomiting persists, the stimulants must be administered per rectum ; and, if necessary, ammonia hypodermically. The patient must be kept quiet on her back, and free from pain by morphine subcutaneously, or laudanum added to the enemata. In other desperate cases, when the patient does not sink from exhaustion, we scarcely expect she will survive the secondary dangers of hemorrhage, peritonitis and septicæmia.

HEMORRHAGE.

Should internal hemorrhage occur, indicated by progressive faintness, and a feeble, frequent pulse, the wound must be re-opened, the bleeding vessel secured, and the peritoneal cavity again cleansed. This appears a desperate undertaking, but the condition is an extreme one, as the patient, if left alone, will bleed to death. The above procedure offers the only hope of arresting the hemorrhage. During all this time, the operator must be on the constant watch for untoward symptoms.

PERITONITIS.

Thomas says : "The evils which are chiefly to be feared as sequels of the operation are, within the first twenty-four hours, hemorrhage ; from second to fourth day, peritonitis ; from completion of operation to third or fourth day, nervous prostration ; and from fourth to fourteenth day, septicæmia."

Wells says : "After ovariectomy, the most frequent cause of death is peritonitis, or some form of fever or blood poisoning, so often associated with peritonitis."

Barnes says : "A more serious form of peritonitis is one that seems analogous to the puerperal form. Here there is commonly septicæmia, or inflammation is propagated from the seat of the pedicle, in which some unhealthy action is going on.

Septicæmia may occur, although not commonly, without much peritonitis. The symptoms then are very similar to those of septicæmic puerperal fever, and should be treated in a similar manner."

FEVER.

Very recently, Mr. J. Knowsley Thornton, of London, read a paper before the *Royal Medical and Chirurgical Society*, asserting that there is a *fever* following ovariectomy. For many of his data he was indebted to Mr. Wells, whom he had assisted in the greater number of his last 300 operations. He believed there was a *simple fever distinct from that caused by peritonitis or septicæmia*, but liable to lead to serious lesions in important organs, if not checked ; attributed this form of fever chiefly to the sudden increase in the volume of blood, circulating in the body after the removal of the large circulating area contained in the tumor ; and indicated the various organs which might suffer, drawing special attention to the brain as receiving a large blood-supply. Mr. Wells, who was present, coincided with Mr. Thornton, and said he had noticed that the chief cause of death after ovariectomy was not peritonitis as much as fever.

This new theory, sustained by the authority of Mr. Wells, must, I presume, be accepted, and *fever*—pyæmic fever—added to the sequelæ following ovariectomy. This condition, separately, or in conjunction with peritonitis, would certainly make the symptoms, as suggested by Barnes, analogous to those heretofore known as "puerperal fever." But this makes "confusion worse confounded," as the great discussion of the Obstetrical Society of London, in 1875, decided, if it decided anything, that there is no such disease as puerperal fever, *per se*. This opens a wide field for discussion, which we cannot here enter. The practical question which concerns the ovariectomist, is : Are the sequelæ following ovariectomy analogous to those following parturition—be they fever, peritonitis, pyæmia, septicæmia, or icorrhæmia ? We must, I fear, leave these questions to be settled by investigators having the opportu-

nity of pursuing their inquiries on a large scale ; and, in the meantime, treat the case under our care according to the light and knowledge in our possession.

Since the symptoms of peritonitis, and the condition designated septicæmia are so graphically described in recent works, it is unnecessary to detail them in this paper.

The operator must be constantly on the watch, and should, at any time, the temperature advance one or two degrees above the normal condition, while at the same time the pulse and respirations become more frequent, he must immediately take steps to control the circulation and lower the temperature. The wound, and drainage-tube, if employed, must be examined and carefully cleansed. A full dose of fluid opium must be given at once, and repeated every three or four hours, or so often as necessary to keep the patient free from pain. In addition, I would give ten grains of quinine, in powder, mixed with two grains of aromatic powder, every two or three hours, by the mouth, if the stomach will retain it, and if not, then in enemata with the brandy, which must be now increased, as well as other sustaining nourishment. Locally hot fomentations and turpentine stupes, or dry heat with soft flannels, are useful, and sometimes afford great comfort.

The head should be somewhat elevated, and kept cool by means of the iced-water cap, or with bladders partially filled with pounded ice constantly applied to every part of it and the nuchal region. I have seen this treatment arrest a violent attack of puerperal peritonitis, and also a pretty high fever following ovariectomy.* Some resort to blood-letting, and the administration of aconite, and veratrum viride, as a means of reducing the febrile temperature, but I must confess that I have no faith in such therapeutics ; indeed, in a case of an asthenic type, I believe they do positive harm by unduly depressing the vital forces.

Dry cold applied to the head, however, by means of the ice-cap, or the coiled tubing conveying iced water—as first practiced in Glasgow for injuries to the head, employed by Mr. Thornton to reduce the febrile temperature following ovariectomy, and approved by Mr. Wells—I doubt not—will prove useful for that object, as I have observed its beneficial effects for injuries of the head in the Hamilton Hospital. Others have recourse to the use of the ice-collar to the neck, the ice-bag to the spine, or the iced-bath for the same purpose, and with astonishing results.

SEPTICÆMIA.

The existing peritonitis, if not speedily checked, especially if the inflammation has been set up by decomposition and septic absorption, will quickly develop or result in that more formidable condition—septicæmia.

* Vide Appendix. Case III.

Not unfrequently the two are combined, or run concurrently, at least, it is impossible to define where the one ends and the other begins. Some assert that septicæmia may occur without any previous perceptible peritonitis. Usually, however, septicæmia is the result of peritonitis, which has been started by septic absorption. The symptoms by which it is ushered in are well portrayed in the quotation from Thomas's work concerning this condition, and the use of the drainage-tube. The topical treatment of the peritoneal cavity by means of antiseptic injections through the drainage-tube must be resorted to, and in case the tube has not been employed, the cavity must be boldly tapped, all turbid serum withdrawn, and then thoroughly cleansed by antiseptic injections through the canula.

CONCLUSION.

In conclusion, permit me to say that ovariectomy is an onerous undertaking. The conscientious surgeon finds, from the moment he takes the case in hand, that, in addition to the anxiety he must feel, it makes a demand upon his time, thought, nerve and skill, for which no merely financial remuneration can possibly recoup him. It is the conviction of the writer that no practitioner should undertake this formidable operation, who has not had considerable experience as a surgeon, and who has not a *penchant* for such practice; who cannot transfer his patients with contagious diseases to another, and surround himself with skillful and cool-headed assistants; and who will not devote himself almost exclusively to the after-treatment; for, unquestionably, it is by strict attention to the preparation, and the totality of the little circumstances connected with the operation, as well as, and more particularly, the after-treatment, that success so much more frequently is now the result of the operation.

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APPENDIX

CONTAINING THE HISTORY OF SEVERAL TYPICAL CASES MET WITH
IN PRACTICE.

CASE I.—*Ovarian disease, of four years' duration.—Ovariectomy.—
Unilocular cyst.—Pedicel secured by the Extra-peritoneal method.—
Recovery.*

M. H., Canadian, aged 23, single; a smart, active, dark-complexioned, healthy-looking young woman; but presents the appearance of a pregnant female at full term. Has always enjoyed good health; menstruates regularly, and her appetite and digestion are good.

The enlargement commenced "low down" in the pelvis at least four years ago, but cannot remember that it was on one side more than the other; when, however, she became very large, the left side was fuller and more uncomfortable than the right. Her size, she is sure, varies. The abdomen measures 35 inches at the umbilicus, and 15 from the ensiform cartilage to the pubes. It is oval and convex, perfectly smooth under palpation, dull on percussion, and yields fluctuation in every part of the enlargement. There is neither hardness nor tympanitis at any point, even on change of position from side to side. The uterus is normal, both in size and position. Neither bulging nor fluctuation can be elicited through the vaginal walls.

Diagnosis: Ovarian tumor—unilocular.

Ovariectomy.—Four days after the cessation of the menses, the patient, having been well prepared and settled in a cheerful, well-appointed room, was chloroformed, and an incision, four inches in length, carefully made on a grooved director, in accordance with the method recommended on page 7. On opening the peritoneum, a small quantity of ascitic fluid escaped, and the white, glistening walls of the cyst came into view. No adhesions being within reach of the fingers, a large steel sound, warmed and disinfected, was passed carefully around the tumor without meeting with any obstruction. The patient was then turned on her left side, when the tumor immediately bulged into the wound. It was now seized near the upper end of the incision by a pair of strong long-toothed forceps, and firmly held *in situ* while a large trocar was plunged into the cyst. Three gallons of thin water-colored fluid quickly flowed away through the canula, and as the cyst collapsed, it was easily brought through the wound by means of gentle traction with the forceps. The cyst was found to have sprung from the

anterior edge of the left ovary and the corresponding band of the broad ligament. The right ovary was in a normal condition. The pedicle, which was about two inches wide and of moderate length, was secured by Koeberle's clamp, but as this did not constrict the stump satisfactorily, a ligature also was used and the stump mummified by the actual cautery. Not a drop of blood nor cyst fluid had escaped into the peritoneal cavity, and as there was no hemorrhage along the course of the abdominal wound, it was immediately closed by three deep, and four superficial, wire sutures. A light compress of lint saturated with carbolized oil was placed over the wound; then several layers of cotton batting, two or three napkins and a wide bandage completed the dressing. The patient was then placed in a good warm, comfortable bed, with the shoulders and thighs raised, for the purpose of diminishing the tension upon the abdomen. Forty drops of laudanum with fifteen of aromatic hartshorn were given in a dessert spoonful of cold water. Pulse 84; head cool, but somewhat excited and flighty—the effect of the chloroform. The cyst and contents weighed 27 pounds. The patient slept nearly all the afternoon and evening, waking occasionally, and vomiting three or four times. Had nothing but small pieces of ice to cool the mouth and allay the thirst. At 8 P.M. the pulse was 110, and the reaction moderate. Complained of a dragging pain at seat of pedicle. The bladder was emptied every eight hours with the catheter. Administered an anodyne injection per rectum (tr. opii ʒj., warm thin starch ʒj.) every four or five hours, to secure freedom from pain. During the first night she vomited once only, and not afterwards. Had nothing by the mouth except ice to suck until the evening of the third day, when she was allowed fresh milk and lime water, iced, in equal parts, a tablespoonful every hour. During the second night she had some fever, pulse 120, lasting about five hours, followed by a slight perspiration and a "show" of the menses. The menses increased in quantity, and continued three days, notwithstanding that the operation was performed the fourth day after their normal cessation. She had no pain after the second night, and the anodyne injections were omitted. On the fourth day slight nourishment was allowed in increasing quantities, and from this time her convalescence was continually progressive.

The use of the catheter was discontinued after the fifth day; the wound healed by the first intention; the superficial sutures were removed on the fifth day, and the deep ones on the ninth; the clamp came away on the 16th, and on the 21st she left for home. About two years subsequently she was married to a builder of this city, and in fifteen months thereafter I had the pleasure of delivering her of a fine, large, healthy-looking son.

CASE II. — *Unilocular Ovarian Tumor. — Ovariectomy. — Adhesions. — Ligatures. — Pedicle secured by the Extra-peritoneal method. — Drainage. — Recovery.*

Mrs. K., aged 25 years, married, the mother of three children—none of them living—a light-complexioned, fair-haired, delicate-appearing woman, under the care of Dr. O'Neil, of this city. At the birth of her last child (19th Nov., 1875), her medical attendant mentioned that she had an enlargement of the abdomen which might be caused by an ovarian tumor. About five weeks after her confinement she was taken very ill, and the same gentleman attended her for an attack of "inflammation," when he said the enlargement still existed. Subsequently the case passed into the hands of Dr. O'Neil, and it was in consultation with him that I attended her. The tumor was rather obscure as to its nature, rising nearly to the umbilicus. It was very protuberant anteriorly, projecting, as it were, from the pelvis as in pregnancy between the fifth and sixth months. It was dull under percussion, and fluctuation was very obscure. I have no note of the measurements.

Some weeks later another examination was made. The tumor had somewhat increased in size, and fluctuation was more distinct. The uterus was found high up behind the lower margin of the tumor, the sound passing in two and one-half inches. The tumor was then tapped with a hypodermic syringe and about one drachm of amber-colored fluid withdrawn, which did not coagulate spontaneously.

Diagnosis: Ovarian tumor; ovariectomy recommended.

Ovariectomy was performed at 11 A.M., on May 16th, 1876. The tumor proved to be monocystic. On being tapped the contents flowed out freely and the cyst was speedily emptied, and easily brought through the incision, which was about five inches in length. The omentum was found adherent to the cyst in several places, and after being separated, bled so freely that we were obliged to have recourse to several silk ligatures to arrest the hemorrhage. The ligatures were all cut short and left in the peritoneal cavity. As some oozing of serum still continued a drainage-tube was placed in the wound, with the lower end down into Douglas's cul-de-sac. The pedicle being of moderate size and sufficient length, was secured by a Spencer Wells's clamp, and thus treated by the extra-peritoneal method. At the conclusion of the operation (according to the notes carefully taken by Dr. O'Neil), the pulse was 78, and gradually increased in frequency during the afternoon and evening until it reached 110 per minute, the highest number recorded during the convalescence. The temperature rose, the same evening, to $101\frac{1}{2}^{\circ}$, and with one exception when it reached 102° , this was the highest temperature recorded. In order to keep the

patient at rest and free from pain two grains of pulv. opii. were administered about every sixth hour, during seven or eight days. The convalescence was progressive from the time of the operation. During the first two days a great quantity of serum oozed from the abdominal cavity, coming out around the drainage-tube and pedicle until it saturated the folded sheets, etc., below the patient. On the 24th (the 9th day), the pulse increased to 108, and the temperature to 102°. Upon examination the drainage-tube was found full, and turning the patient on her side four ounces of very offensive pus flowed away. The pulse, the same evening, fell to 85, and the temperature to 99°. During the following three days, the patient was morning and evening turned on her side, and each time a small quantity of pus was discharged, and on one occasion some "fleshy pieces." No disinfectant syringing was resorted to. The sutures were removed, some on the ninth, the remainder on the 13th day, and with the last stitch the clamp fell off. The patient was soon up and about, and from time to time reported herself feeling "as well as ever." She is now again pregnant.

CASE III.—*Multilocular Ovarian Disease.*—*Ovariectomy.*—*Pedicle treated by the Intra-peritoneal method.*—*Partial enucleation.*—"Tied and Dropped."—*The Drainage-Tube.*—*Fever.*—*Recovery.*

Miss N., from the county of Brant (through the kindness of Dr. W. Corson, of Brantford), consulted me on Nov. 1st, 1877. Her health has been rather delicate since childhood, but never had any severe illness. Digestion had always been good until within three or four months, when she noticed that she felt full and uncomfortable after meals. This caused her to seek the advice of Dr. Corson, who discovered that her abdomen was considerably enlarged, due to the presence of an ovarian tumor.

For about a year she had been aware that she was gradually becoming stouter, and at Christmas (1876), her dressmaker remarked it, but this did not occasion any surprise, on the contrary, she congratulated herself, as she presumed she was "growing out" of her former delicate condition.

Present State.—Of medium size, sandy complexion; fairly well nourished. All the organs and functions of the body appear to be in a normal condition. Her friends remark that she does not look so well in the face as she did two or three months since.

Physical Signs.—In the standing position she appears very much like a woman seven months gone in pregnancy. The tumor is not very rotund and prominent; it is rather flat, but entirely fills up the hypogastric, both inguinal, and the umbilical regions, extending three inches

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above the navel. Under pressure, it resists like a full sac, but does not feel solid like a fibroid. The whole surface yields dullness under percussion, and deep-seated fluctuation is obscurely elicited, with the exception of a large portion occupying the right iliac region, where the tumor is hard and uneven. Simpson's sound passed $2\frac{1}{2}$ inches into the uterus, in the left lateral direction. The tumor is felt by the finger, on the right side of the uterus. The measurements are as follows :

Girth at umbilicus.....	33 inches.
From umbilicus to ens. cartilage.....	5 $\frac{1}{2}$ "
" " " pubes.....	5 $\frac{1}{2}$ "
" " " right a. s. s. process.....	7 $\frac{1}{4}$ "
" " " left a. s. s. process.....	6 "

Tapped with a hypodermic syringe, the cyst yields a thin straw-colored fluid, which is not spontaneously coagulable.

Diagnosis: Ovarian tumor—multilocular, springing from the right ovary.

Nov. 24.—Miss N. having been in the city several days, getting accustomed to her lying-in room and other surroundings, the menses having ceased five days since, and being in all respects in a pretty good and hopeful condition, the operation was proceeded with.

The patient having been chloroformed, and the abdominal section, five inches in length, made in the usual way, the tumor was readily brought into view; the patient having been turned on her left side, the cyst was tapped with an ordinary trocar, and the contents being thin, it was rapidly emptied of about twelve pints of thin straw-colored fluid. The tumor was then brought through the incision without further enlargement, and found to be composed of an aggregation of small cysts, somewhat resembling the honey-comb, filled with a similar fluid to that of the parent cyst. The weight of the tumor and contents was eight pounds. The pedicle was very short, and had to be enucleated (according to Dr. Miner's process), several inches from the tumor, before sufficient length was obtained to permit of manipulation. The sound part was then ascertained to be too short for the application of a clamp, and recourse was had to "tying and dropping." A double silk ligature was passed by means of a large needle through a thin part near the centre of the pedicle, and each half first secured separately, and then as an extra precaution one of the ligatures was tied tightly around the whole. The oozing enucleated portion was then amputated by the actual cautery.

The pedicle, contrary to the diagnosis—based upon the fact that the uterus was in the left side of the pelvis, while the lower part of the tumor was felt on the right side—was found to have sprung from the

left ovary. This anomaly was accounted for, when it was found that the solid portion of the tumor had sent a projection downwards into the pelvis, which had crowded the uterus over to the left. As serum continued to accumulate in the pelvic cavity, after it had been thoroughly sponged, drainage was provided for, by inserting a tube, before closing the wound. After this had been accomplished in the usual way, the patient was placed in a good comfortable bed, with warmth to the feet. She quickly rallied from the chloroform, and as she complained of some pain, 40 drops of laudanum with a little brandy and iced water were administered. The pulse was now 72 and the respiration 38. An hour subsequently the pulse was 75, and in two hours 80. As she still complained of pain, 50 drops of laudanum were given in a little brandy and iced water. She is now thirsty, and is allowed ice to suck, but nothing to drink.

At seven o'clock the same evening, reaction was found thoroughly established. Pulse 100; respiration 22; skin warm and moist; feels "too warm," notwithstanding the hot bottles and some of the bed clothing had been removed; vomited a small quantity, once only, about 4 p.m. Took away, per catheter, about seven ounces urine. Said she felt some pain, and was given another dose of laudanum with brandy and water, iced.

11.30 P. M.—Has not vomited since 4 p. m.; has slept a couple of hours; feels but very little pain. Pulse 96; respiration 20; temperature $100\frac{1}{2}^{\circ}$. Took away six ounces of urine; gave enema—beef essence ʒij , tr. opii, ʒss , brandy ʒij . To have nothing excepting ice by the mouth.

25th, 8 A. M.—Had a very good night; vomited once this morning "a little greenish fluid;" slept nearly all night, waked occasionally, and had a piece of ice; pulse 82; respiration 18; temperature $99\frac{1}{2}^{\circ}$. Took away the urine, and repeated the enema.

1 P. M.—Has been comfortable during the forenoon; vomited again about 8.30, but not since; pulse 88; respiration 16; temperature $100\frac{1}{2}^{\circ}$. Took the urine, and repeated the enema. As the drainage-tube was nearly full, it was emptied by sucking ʒij of reddish fluid out, with the bulb of a syringe having a small flexible tube attached. The tube was then washed out by injecting a small quantity of warm water, slightly carbolized, and containing a few grains of table salt. This solution was immediately withdrawn by means of the syringe, and the process was repeated several times until the fluid returned clear.

6 P. M.—Has not vomited since morning; slept about two hours; pulse 96; respiration 16; temperature $101\frac{1}{2}^{\circ}$; took away the urine; repeated the enema; withdrew about ʒij reddish serum from the pelvic cavity, and washed it out as previously.

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11:30 P. M.—*Has slept considerable since seven o'clock; feels comfortable; skin moist; no pain; no headache, but states she feels "hot;" pulse 104; respiration 17; temperature 101°. Took away the urine, and repeated the enema. She has had thus far nothing by the mouth excepting ice.*

26th, 8 A. M.—*Had a comfortable sleep up to three o'clock this morning; since that time she has been restless with a desire to urinate; has not vomited since yesterday morning, and the stomach feels settled; skin moist; pulse 102; temperature 100. Took away 3ij urine, and repeated the enema. Brought away 3ii reddish serum and washed out the drainage-tube.*

6 P. M.—*Nurse states, patient has had a fever since 1 p. m. The skin is dry and hot; pulse 123; respiration 17; temperature 101³⁰°. Removed the urine, and gave per enema: mutton broth, 3vj., brandy 3ss., tincture opii. 3i., sulphate of quinine grs. xv. Ice to the head.*

8:30 P. M.—*Has slept soundly, and perspired freely; as soon as she awoke the perspiration ceased and the skin again became hot and dry; begs constantly for ice when awake; pulse 113; respiration 17; temperature 101°. Repeated the last enema, with the exception of the opiate; continued ice to the head.*

MIDNIGHT.—*Has rested well, and slept most of the time since 9 p. m.; no pain; skin moist; pulse 126; respiration 17; temperature 101³⁰°. Took urine; gave mutton broth—per enema; and by mouth, sulphate quinine, grs. xv., brandy 3ij., iced water 3ij.; continued ice to the head, and ice to suck.*

27th, 8 A. M.—*Has had a good night, and slept the most of the time, but when she wakened occasionally, wanted the ice as usual. The ice was continued to the head during the whole night. The fever gradually abated towards morning; she is now free from fever. The temperature is normal (98¹/₂°). Pulse 100; respiration 17. Did not vomit the medicine, and at 4 a. m. had a little brandy and iced water; complains of noises in her head owing to the quinine, and inability to see well. Permitted her to have a little black tea, with cream and sugar, which she relished, and as the stomach now begins to crave for food, she is to be allowed some fluid nourishment by the mouth. Washed out the drainage-tube with the syringe, but only two or three pieces of debris came away with the injected fluid. Gave eight grains of quinine in a little iced brandy.*

1 P. M.—*She appears much better, has neither fever nor pain. Passed her urine without the aid of the catheter. Pulse 75; respiration 17; temperature 98¹/₂°. The ice to the head had been omitted since morning. Had no opiate since yesterday evening. Has taken some egg and milk containing a little brandy.*

10 p. m.—Continues to improve, she is cool, moist, and perfectly free from fever. Pulse 85; respiration 14; temperature $97\frac{1}{2}^{\circ}$.

28th, 8. a. m.—Still improving, states she feels hungry. The menses came on this morning. As flatus was becoming troublesome, the bowels was relieved by an enema of warm water.

During the next few days the drainage-tube was frequently emptied and syringed out; on one occasion half an ounce of offensive pus was brought away, and several times *debris* of broken down tissue. But from the above date she continued to improve, with the exception of the 7th, 8th, and 9th days, when she did not feel so well, as considerable suppuration occurred in the sheath of the right rectus muscle. This, however, soon ceased, and her recovery was rapid.

REMARKS.—The chief interest, in this case, centres in the fact that the operation was followed by a *fever*, unaccompanied by any inflammatory symptoms whatever; and that this fever was controlled and arrested by the prompt administration of quinine, in large doses, bringing the temperature down from nearly 102° , to below the normal ($97\frac{1}{2}$), within 24 hours. The case also demonstrates the usefulness of the drainage-tube, through which the pelvis was cleansed from decomposing materials, and septic absorption probably averted.

CASE IV.—*Multilocular Ovarian Tumor.—Extreme condition.—Tapping.—Rectal alimentation.—Peritonitis.—Ovariectomy.—Extensive adhesions.—Pedicle ligatured and secured with the wound.—Exhaustion.—Fatal Result.*

MRS. MCA, aged 42, married, the mother of six children, consulted me on March 10th, 1872, for an enlargement of her abdomen. Ten months previously she first noticed "a swelling low down on the left side," which increased rapidly during the next three months, and this she concluded was due to pregnancy. Her size then remained stationery for some time and she became doubtful as to the nature of her condition. During the winter months, however, the enlargement again gradually increased. Upon examination, the abdomen presented the appearance of an eight months pregnancy. It was protuberant, irregularly uneven, and everywhere dull under percussion. Fluctuation was very distinct at the upper and right side of the tumor, while the left side and lower portion were hard and unyielding.

I informed the woman and her husband that I believed her enlarged condition was due to the presence of an ovarian tumor of a compound nature; and proposed a consultation for the purpose of making a more critical examination. This they considered, postponed, and declined; and shortly afterwards placed the case under the treatment of a notorious itinerant charlatan, hailing from Buffalo.

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On Feb. 3rd, 1873, eleven months from the former time, I was again requested to visit the patient. They then informed me that the charlatan had continued his treatment three months with positive assurances that he would cure her of the "dropsy," but finding she was losing flesh and strength she discontinued his treatment. In September, having contracted a cold, she became very poorly and took to the bed, where she had been confined all winter. While her health has been failing, the tumor has been increasing in size, so that now it completely fills the abdominal cavity, pressing up against the liver, stomach, spleen and diaphragm so as to seriously obstruct the respiration. The girth of the abdomen at the umbilicus is $46\frac{3}{4}$ inches, and measurement from the ensiform cartilage to the pubes is 26 inches. She is now in an extreme condition; pulse feeble; respiration 42; face pallid; lower extremities very cedematous; and vomiting frequently. She begs me to do something quickly for her relief. "You may do anything," says she, "for I can't live." I explained to her that she was too weak to bear the operation of ovariectomy, and that, under the circumstances, the only procedure admissible was that of tapping. This she then urged me to do immediately. Therefore, during the afternoon, assisted by Dr. Malloch, I performed that operation with a common large sized trocar, in the median line midway between the umbilicus and symphysis pubis. The contents, which came away very slowly, were of a dark color, and of the consistence of syrup. When this cyst ceased to flow it was evident, from the enlargement and fluctuation still existing above the umbilicus, that one or more cysts remained to be emptied. Withdrawing the canula, a long curved trocar was directed, through the same orifice, obliquely upwards and pushed into another cyst, the contents of which proved to be thicker and more gelatinous than those of the former. These resembled soft soap in consistence and appearance.

The contents of the cysts being so tenacious, notwithstanding the discharge was expedited by pressure with the hands on either side of the abdomen, two hours were occupied in emptying them. The matter thus discharged measured twenty-two quarts, or five and one-half gallons. The operation of tapping was very exhausting in the patient's weakened condition, but nevertheless as the size of the tumor was diminished, she several times expressed herself as feeling much relieved, and the pale anxious *facies* improved in color and appearance. The respiration decreased to 26 and the pulse to 90. The tumor was now reduced to about the size of, and felt very much like, the womb containing a large placenta after child-birth; but owing to adhesions, as we presumed, it could not be pressed down into the pelvis.

The vomiting which had been so distressing previous to the operation, persisted for the three subsequent days, notwithstanding the fact that we

administered neither anæsthetic nor medicines. During this time nothing but morsels of ice could be taken into the mouth, and for two weeks life was sustained by rectal alimentation. Enemata of beef-essence and other nutritive materials were administered in quantities of about two to four ounces at a time, every three or four hours. At the end of a fortnight her stomach began to bear a little milk and lime water, and by and by, two or three raw oysters sprinkled with lemon juice, and other light easily digested food. On the 25th of this month she had a sharp inflammatory attack, attended with acute pain in the right side, between the illium and the liver, which fortunately was alleviated in a few hours. From that time she slowly improved, and with the improvement came an increasing desire to have the tumor removed. At each occasional visit during the month of May, she urged me to make up my mind to perform ovariectomy. During this month she had been up and about the house, much improved, but still weak and pale. The cysts had been gradually refilling, so that she now measured 40 and 20 inches respectively, instead of 46 $\frac{1}{2}$ and 26 previous to the tapping.

Keeping in mind the existence of strong adhesions and her unfavorable condition, I explained to her, and her friends, the great danger, and uncertainty of the operation under the circumstances. To this she quietly remarked that they fully understood all this, and again calmly argued that she could not live but a short time if the tumor was not removed, and said she ardently wished that this should be attempted.

Seeing that the hot weather was fast approaching, and it being more than probable that she would not survive the summer months in that condition, I determined to yield to the patient's solicitations and make the attempt to remove the tumor.

Accordingly on June 3rd, 1873, ovariectomy was with difficulty accomplished. Chloroform having been administered, the abdominal walls being thin, the tumor was quickly exposed through an incision about six inches in length, which was afterwards lengthened to eight inches. On attempting to pass a couple of fingers between the tumor and abdominal parietes, firm adhesions were found in every direction. These, as far as they could be reached, were slowly separated with the fingers. The patient was then turned upon her left side and the tumor tapped with a large trocar and canula, improvised for the occasion; but as the contents were thick and came away very slowly, a free incision was made into the cyst with a bistoury, when the thick gelatinous matter escaped rapidly. The tumor* was then slowly withdrawn through the incision, when two broad bands were brought into view. One of these was the pedicle

*The tumor, when laid open after removal, was seen to consist of one large cavity surrounded by an aggregation of small cysts in its walls, and bore evidence of broken down cysts in its interior.

reaching from the right ovary to the superior part of the tumor, while the other—a very broad band—proved to be the bladder adherent by its posterior surface and elongated upwards. Considerable difficulty was experienced in separating the adhesions between the bladder and the tumor.

A piece of whip cord was tied around the pedicle and the tumor excised; a loop of the whip-cord served as a convenient handle with which the pedicle was held by an assistant until it was properly secured. Oozing of bloody serum continued from the ruptured adhesions, and it was some time before the abdominal walls could be closed. The pedicle was securely ligatured with whip-cord, at a suitable length from its root, and transfixed in the lower part of the wound by a large needle passing through the centre below the ligature. The abdominal cavity having been very carefully sponged, the wound was closed with silver wire sutures and dressed in the usual way. The patient was then placed in a comfortable bed, and an anodyne administered per rectum. She rested very well that night; remained very quiet; did not vomit; complained of nothing, and received small pieces of ice when they were put into her mouth. The next day it was apparent that she was not rallying from the effects of the operation, and notwithstanding the efforts made to revive her sinking powers, she gradually failed until she quietly and easily passed away about nine o'clock in the evening.

Thus ended what seemed a hopeless undertaking; but cases apparently equally hopeless had recovered, and as my patient urgently requested that the attempt should be made, I was unwilling she should be left to her fatal disease without an effort being made for her rescue.

CASE V.—*Multilocular Ovarian Tumor.*—*Peritonitis.*—*Obstruction of the Bowels.*—*Ovariectomy.*—*Adhesions to Omentum.*—*Clamp.*—*Drainage.*—*Septicæmia.*—*Recovery.*

Mrs. W., widow, aged 40, sterile, came from Ohio, and was admitted to the Hamilton City Hospital under my care June 10th, 1876. States that she has never been a strong person; has had a cough several years; catamenia have been regular; never has been pregnant; four years ago had an attack of pneumonia, which lasted ten weeks; last summer had typhoid fever and was ill five weeks. Her husband died in February last, and immediately after his death she was taken with nausea and vomiting, which continued about two months, at the same time she noticed that her abdomen was enlarging rapidly and she did not know but that she might be pregnant.

Present State.—She is of medium size; sallow complexion; emaciated; feet and ankles œdematous; abdomen considerably enlarged and presents the appearance of a seven months' pregnancy. Skin cool;

tongue coated brown; constipated; pulse 106; temperature 99°; respirations 25 to 28, irregular.

Physical Signs.—The abdomen is rotund, a decided protuberance existing anteriorly, and very little flattening out by sagging of fluid to the flanks. Under palpation the tumor resists like a full sac. The fluctuation elicited is of a deep-seated character, and can be made out over the whole tumor, with the exception of a space of about four inches in diameter, situated midway between the umbilicus and right anterior superior spinous process of the illicum; this region yields the sensation of hardness under percussion, and in it she has suffered severe pain for three or four weeks. By vaginal and rectal touch the lower margin of the tumor can be felt and obscure fluctuation elicited. The uterus lies high up behind the tumor, and measures the normal two and a half inches. Simon's recommendation of examining the tumor posteriorly by means of the hand in the rectum was not enforced.

The measurements were as follows:

Circumference of abdomen at umbilicus.....	32½ inches.
From ensiform cartilage to pubes.....	15 "
" umbilicus to pubes.....	7½ "
" " ens. cartilage.....	7½ "
" " r. a. s. s. process.....	7½ "
" " l. a. s. s. process.....	7½ "

The tumor was tapped with the hypodermic syringe, and about half a drachm of thick, syrupy, straw-colored fluid withdrawn. This was not spontaneously coagulable. It was subsequently examined by the microscope, but the presence of the disputed cell was not discovered.

Diagnosis: Ovarian tumor, which is probably polycystic.

On the afternoon of the 13th she was suddenly attacked with a sharp lancinating pain in the solid portion of the tumor to the right of the umbilicus, which rapidly extended over the whole abdominal region, accompanied with vomiting, fever, and frequent pulse. In the course of two hours the pulse ran up to 140, became small and thready, and the vomiting very frequent. The bowels had been constipated since her admission to the Hospital. Ordered hot turpentine stupes to the abdomen, and ½ gr. morph. sulph. hypodermically every three hours, if necessary; also a little brandy and iced water.

JUNE 13th.—The medicines and hot fomentations gave great relief and after getting the second hypodermic injection she passed a comparatively comfortable night, but vomited several times through the course of the night and this morning. The pulse is now 140, but softer and fuller. Tongue brown, furred. Bears slight pressure over the abdomen without complaining. Bowels not moved.

EVENING.—Condition improving. Pulse 140. Tongue moist, and not so thickly furred. Does not complain of pressure over the abdomen, except in the right hypochondrium. Ordered a turpentine enema, and the hypodermic injection of morphia to be repeated if necessary. Continue the iced brandy.

15th.—Improving. Had a good night after the morphia, but the bowels were not moved by the enema. Pulse 130, softer and fuller. Skin moist and cool. Considerable tenderness in the right hypochondrium, and has paroxysms of pain three or four times a day. Ordered beef tea, milk and brandy, and the hypodermic injection to be administered when necessary to relieve pain.

17th.—Continues much the same. No movement of the bowels. Rest disturbed by attacks of pain on the right side of the tumor; has had the morphine three or four times in 24 hours. The menses appeared during the night—scanty.

20th.—Rather more comfortable. The stomach bears nourishment a little better; the bowels remain obstinately constipated. The œdema of the feet and legs has subsided. Pulse 120; temperature 98°; respiration 22.

22nd.—At a consultation of the Hospital staff, the critical condition of the patient, the existing peritonitis, the probability of disorganizing changes taking place within the tumor, and the sure and certain end rapidly approaching having been recognized, and a free interchange of opinion expressed, ovariectomy was decided upon. The operation was commenced at noon, in the presence of the faculty and a number of practitioners and medical students. Dr. Mullin administered the chloroform in his usual careful and attentive manner, and Dr. Malloch kindly acted as chief assistant. The abdominal section was made five inches in length, but this was afterwards increased to seven inches. On opening the peritoneum some ascitic fluid flowed away, and through this the bluish-white glistening tumor was recognized. As no adhesions could be felt with the fingers the patient was now turned on her left side, the presenting cyst seized at the upper end of the incision by a pair of strong, long-toothed forceps and steadied while being tapped with a large trocar; but through the canula of this instrument the jelly-like contents, assisted by pressure with the hands, came away so slowly that considerable time was occupied in evacuating the cyst. After the parent cyst was thus lessened, similar smaller ones came into view, and were one after another laid open freely with a bistoury and quickly emptied. The contents of each of the smaller cysts was found to differ from the other, both in color and consistence.

Though about one-third of the tumor proved to be solid it was thus sufficiently reduced in size to permit its being extracted through the

enlarged incision, by traction with the forceps, assisted by the hands of the operator. Now it was seen that the omentum was closely adherent in several places to the superio-posterior part of the tumor. Considerable difficulty was experienced in separating these adhesions, which, on being accomplished, bled freely. The omentum was then turned up and carefully laid upon a soft napkin placed across the abdomen, and the bleeding points were secured by the use of a number of small silk ligatures. The ligatures were all cut short and the omentum was immediately returned to the peritoneal cavity. While Dr. Malloch was thus arresting the hemorrhage of the omentum, the operator was engaged in securing the pedicle. This was found attached to the right side, and being of moderate length it was first tied with whip-cord, near the tumor, and the latter cut away and removed. A loop was then made with the cord, affording a convenient handle with which to manipulate the stump. This was treated by the extra-peritoneal method—fixed external to the wound by means of a Spencer Wells's clamp. Portions of the intestine appeared inflamed and deeply congested. After the peritoneal cavity had been thoroughly sponged, it was found that some oozing of bloody serum continued, and as a number of ligatures had been left upon the omentum it was deemed advisable to provide for drainage, therefore, a large glass drainage-tube was inserted, above the pedicle, reaching down into Douglas's space. The abdominal wound was then closed and dressed in the usual manner, and the patient was placed in a clean, warmed, comfortable bed, with warm applications to her feet. She slept two hours from the effect of the anæsthetic, waking two or three times, when she was given a little iced water.

The following notes are abbreviated from the Hospital record :

4 P. M.—Complaining of some pain; morph. sulph. gr. $\frac{1}{2}$ was administered hypodermically.

4:30 P. M.—After taking a small quantity of beef-essence she almost immediately vomited—the first since the operation.

9 P. M.—Pulse 140; temperature $100\frac{1}{2}^{\circ}$; respiration 12; about five ounces urine taken away by the catheter. Wishing some drink, she was allowed a little brandy and water, directly after which she vomited nearly a pint of greenish-tinged fluid. Dr. Rosebrugh ordered small pieces of ice at frequent intervals instead of drink, and to have very little fluid during the night; urine to be taken by the catheter every eight hours; morphia hypodermically occasionally, to keep the patient at rest and free from pain.

23rd, 8 A. M.—Had a pretty comfortable night. A hypodermic injection was administered at 10 p. m. and another at 6 a. m. Considerable reddish serum has escaped around the drainage-tube and pedicle, saturating everything about the patient.

Morning	Pulse 136 ; temperature 100 $\frac{1}{2}$ °.
Noon	" 140 " 99 $\frac{3}{8}$ °.
Evening	" 136 " 100 $\frac{1}{4}$ °.
24th,—Morning	" 114 " 99 $\frac{3}{8}$ °.
Noon	" 112 " 99 $\frac{3}{8}$ °.
Evening	" 132 " 100 $\frac{3}{8}$ °.
9 p. m.	" 140 " not recorded.

The patient appeared to be doing so well during the forenoon, that no particular restrictions as to fluid were mentioned to the attendants, but on visiting the Hospital at 9 o'clock in the evening we found the patient in a very low, exhausted condition; the day had been very warm, and too much iced water, milk, etc., had been allowed, and she had had frequent attacks of vomiting during the afternoon and evening. The pulse had increased in frequency from 112 to 140. Gave peremptory orders that she should have nothing during the night excepting small pieces of ice to suck, and occasionally a dessert spoonful of lime water and milk, in equal parts, iced—nothing else.

25th, 8 A. M.—Had a pretty good night, although she remained in a very low and exhausted condition; did not vomit after the restrictions of last night. Pulse 124; temperature 99 $\frac{2}{5}$ °. Ordered the restrictions to be continued. When thirsty may suck ice, but to have no water. Nutritive enemata, consisting of beef-essence to be administered every three hours. This was continued five or six days until nourishment was craved and digested by the stomach. Noon.—Pulse 126; temperature 99 $\frac{2}{5}$ °. Evening.—Pulse 126; temperature 100 $\frac{1}{8}$ °.

26th.—Improving. Has not vomited since being confined to the lime water and milk. The beef-essence per rectum is retained comfortably.

The catheter has been used every eight hours; and the morphia hypodermically has had to be repeated three or four times a day. Pulse 120; temperature 99 $\frac{2}{5}$ °. Evening.—No change.

27th.—Pulse 124; temperature 101°. A small flexible tube attached to the bulb of a syringe, was inserted into the drainage-tube, and about half an ounce of fluid withdrawn, after which, by means of this syringe, the pelvic cavity was washed out with a solution of warm water, containing two drachms of common salt and a few drops of carbolic acid to the quart. In a short time the pulse fell to 120, and the temperature to 98 $\frac{3}{8}$ °. The bowels were moved slightly this afternoon—the first motion for three weeks. At her urgent request the patient was allowed half a small cup of tea, which she relished very greatly, and it agreed with her stomach.

28th.—Pulse 120; temperature 98 $\frac{1}{2}$ °.

29th.—" 104 " 99°.

30th.—" 112 " 99°.

On the 26th the bowels were moved three times; on this day several stitches were removed, also the clamp, which had become loose. The pelvic cavity was daily washed out, a little serum and broken down tissue coming away. The stomach digesting the nourishment very well, a more liberal allowance of food was permitted.

July 1st.—Pulse 124; temperature $100\frac{1}{2}^{\circ}$. The patient is not looking so well—has a sunken appearance. About half an ounce of very offensive pus was found in the drainage-tube, also some pus about the tube in the wound; withdrew the pus, cleansed the wound, and washed out the pelvic cavity, after which the patient appeared much better.

July 2nd.—Pulse 102; temperature $99\frac{3}{8}^{\circ}$.

July 4th.— " 100 " 99° .

The drainage-tube having been forced nearly out of the wound, was removed. The remaining stitches were also removed. The aid of the catheter from this date was discontinued. Bowels moved by the aid of an enema of warm water. From this date she gradually and continuously improved, so that by the 16th she began to leave the bed for a short time, and on the 30th left the Hospital.

The measurements taken a few days previously, were as follows:

Circumference at umbilicus.....23 inches.

Umbilicus to ensiform cartilage..... 5 "

" " pubes..... $5\frac{1}{2}$ "

" " r. a. s. s. process..... $4\frac{1}{2}$ "

" " l. a. s. s. process..... 5 "

For some days she had been wearing well-fitting abdominal corsets, with cotton padding underneath, for the purpose of affording support, and preventing hernia through the recently healed cicatrix. She remained in the city a few weeks before leaving for home. During this short time she improved rapidly, and subsequently wrote that she was gradually getting stronger and stronger and fleshing up again.

REMARKS.—The special points of interest in this case were—the low condition of the patient and the desperate nature of the case, owing to the existing peritonitis; the probability of disorganizing changes taking place in the tumor; the obstinate obstruction of the bowels, due to pressure and inflammation; the extensive adhesions met with during the operation; the difficulty in arresting the hemorrhage; the number of ligatures left in the peritoneal cavity, and the provision made for drainage. In the after-treatment, the exhausted condition resulting from frequent vomiting; the fortunate result of restricting the fluid taken by the mouth; sustaining nutrition by rectal alimentation; and the beneficial effect of establishing drainage, in first permitting the escape of a large quantity of serum, subsequently affording an outlet for the

offensive pus ; and lastly, providing a channel through which the pelvic cavity could be washed with disinfectants, on the advent of the symptoms of septicæmia. Above all, the pleasing knowledge that the woman is now in excellent health—her disease radically cured—and that she bids fair to enjoy many years of health and happiness.

I have given the history of this unusually interesting case in pretty full detail, hoping that by thus showing under what truly desperate circumstances valuable lives may be rescued from a premature death, the benefits the operation has already conferred may be yet further extended by encouraging other surgeons to give the poor sufferer the only hope remaining of escaping the inevitable result, should the tumor be left to finish its deadly work.

In closing the appendix for the present, I cannot with too much emphasis reiterate my conviction that not a little of the success which has rewarded the efforts of the operator, must be attributed to the careful attention given to the minutest particulars, which could even remotely effect the result. In this connection, I desire to return my warmest thanks to my medical friends, who so ably assisted me in bringing this and other difficult operations to a successful termination.

That operator is indeed fortunate, who can surround himself on such occasions with good anatomists, skillful surgeons, and learned physicians, with cool heads, alert minds, and ready hands, anticipating every want of the operator, and prompt to meet any emergency. Such medical gentlemen, I am proud to acknowledge, have always kindly and cheerfully rendered me their valuable assistance.

NOTE.—It will have been observed that sponging the wound and peritoneal cavity with carbolized water ; dressing the wound with carbolized oil ; as well as disinfectant injections through the drainage-tube, were freely resorted to in the cases above recorded. In a recent case of an almost hopeless nature, but which fortunately has resulted successfully, all the instruments, sponges, etc., were kept in a carbolic acid solution ; and after cleansing the peritoneal cavity of a quantity of lymph and escaped contents of the tumor, it was thoroughly sponged, again and again, with the carbolic solution (one in forty). The question remains to be determined : whether ovariectomy accomplished under the carbolic spray may not yield even better results ? Of late, Prof. Schröder, and others, have been operating according to the Listerian method, and they claim to have reduced the mortality thereby. In Schröder's opinion, "*infection* is almost the exclusive cause of death after ovariectomy, and the results will be good in proportion as infection can be prevented." There are objections to performing a lengthy operation under a benumbing spray, but if the antiseptic procedure yield better results, they must be waived.

